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Self-efficacy for seizure management and youth depressive symptoms: Caregiver and youth perspectives

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ABSTRACT

The aims of this study were to (1) compare caregiver and youth measures of self-efficacy for seizure management (SESM), as well as report of depressive symptoms and suicidal ideation in youth with epilepsy (YWE) and (2) examine the potential relationship between caregiver SESM and caregiver report of depressive symptoms in YWE. Seventy-seven YWE ages 9–17 completed the Children's Depression Inventory (CDI) and the Seizure Self-Efficacy Scale for Children with Epilepsy (SSES-C). Sixty-five caregivers completed the Behavior Assessment System for Children (BASC-II) and the Epilepsy Self-Efficacy Scale (ESES). Results showed no agreement between youth and caregiver self-efficacy scores. However, there was low to modest agreement in published classifications of depressive symptoms between youth and caregiver ratings of depressive symptoms in youth, with caregivers reporting higher levels of symptoms than the youth reported. Twenty-seven percent of YWE endorsed suicidal ideation. When caregiver report of their own self-efficacy towards their child's seizures and their assessment of their child's depressive symptoms were compared, there was a significant inverse relationship. These findings suggest a multi-informant approach to assessment of depressive symptoms in YWE, the importance of including self-efficacy for seizure management in assessment and treatment of YWE, and provide support for transactional patterns of psychosocial adjustment.

1. Introduction

It is becoming well-known that, in addition to seizures, youth with epilepsy (YWE) are at increased risk for mental health comorbidities, which likely originate from both psychosocial adjustment and neurobiological etiologies.[1,2] Documenting evidence supports prevalence rates of 12–26% for significant depressive symptomatology[3–5] and higher rates of suicidal ideation in YWE.[4] Seizure management can be very difficult for families, and 30–40% of YWE experience breakthrough seizures.[6]

An emerging theory, "self-management," places emphasis not on illness parameters but on the personal skills or resources needed to manage a chronic illness in the context of everyday life[7,8] and recognizes the necessity of family management given the burden placed on caregivers of youth with a chronic illness.[8] Indeed, studies suggest that YWE and their caregivers are at increased risk for difficulties with daily epilepsy self-management.[1,9] One particular cognitive self-management skill, self-efficacy for seizure management (SESM), appears particularly salient to YWE. SESM is "the *personal conviction of one's capabilities* to initiate and successfully complete tasks associated with the daily management of epilepsy".[10] Lower self-efficacy for seizure management in YWE has shown a significant relationship with more negative attitudes about epilepsy, greater seizure worry, lower family mastery, and greater depressive symptoms.[11–13] In addition, self-efficacy has been shown to contribute to actual self-management outcome behaviors in adults with epilepsy[10,14–16] and individuals with other chronic illness conditions.[17]

Research has shown a significant association between SESM and depressive symptoms in YWE[11–13]; however, no known study has examined caregiver perceptions of self-efficacy to manage their child's seizures and the association of caregiver SESM with youth depressive symptoms, consistent with a family emphasis on self-management[8] and ecological models of family adjustment to chronic illness.[18] Further, no study has compared youth and caregiver report of SESM and depressive symptoms in YWE. Generally, caregiver and self-report of psychological constructs

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and adjustment in youth have low agreement, paricularly for internalizing symptoms.[19] This "disagreement" has also been demonstrated in ratings of behavior in youth with epilepsy,[20] suggesting that multiple respondents may be necessary to capture an accurate representation of functioning. This practice is particularly salient for YWE who, due to neuropsychological deficits, may be at increased risk for poor insight into their own behaviors and how their behaviors are perceived by others.[21,22]

To date, researchers have chosen the Child Behavior Checklist (CBCL[23]) to measure behavioral functioning in YWE via caregiver report.[24,25] Limitations of the CBCL include diagnostic weaknesses, such as a discrepancy between item content and conceputualization of child psychopathology, inclusion of particular items on several scales, and a single negatvie affect subscale representing a combined index of anxiety and depressive symptoms.[22] Few pediatric epilepsy studies have captured depressive symptoms using the Behavioral Assessment System for Children (BASC-II[26]), despite it's classification as a "well-established" assessment tool for measuring emotional functioning in youth with a chronic illness.[27] The BASC-II is a conceptually derived instrument and separates internalizing symptoms into depression and anxiety subscales, which is particularly salient to the differentiation of internalizing symptoms in YWE. Bender et al.[22] evaluated the convergent validity of the BASC-II and CBCL in YWE and found concordance across internalizing scales of the two rating systems per caregiver report of behavioral and emotional functioning in YWE.

To address the above-mentioned gaps in the extant literature, the current study was designed with two aims: (1) to measure and compare caregiver and youth self-efficacy for seizure management (SESM) and caregiver and youth report of depressive symptoms and suicidal ideation in YWE, and (2) to examine the potential relationship between caregiver SESM and caregiver report of depressive symptoms in YWE (the youth SESM and depressive symptom association was previously explored[13]). Thus, we hypothesized, in accordance with previously published data demonstrating higher youth psychosocial distress per caregiver report compared to youth report,[20] that (1) youth report would be lower than caregiver report of youth depressive symptoms and suicidal ideation, and (2) caregiver SESM would be significant but inversely related to caregiver report of youth depressive symptoms, similar to our findings with youth report.[13]

2. Methods and materials

This paper is part of a larger study of psychosocial outcomes in YWE, and the methods (participants, procedures) presented here have been previously published.[28,29] In addition, results on youth self-efficacy for seizure management and depressive symptoms have been published[28] but not in relation to caregiver report of self-efficacy and caregiver report of youth depressive symptoms.

2.1. Participants

Children and adolescents ages 9–17 who were diagnosed with epilepsy for at least one year (ICD-9 345 codes) and had at least low average intelligence (IQ > 85; IQ estimates were based on electronic medical record review by an epilepsy nurse specialist or clinical psychologist in consultation with the health care provider) were eligible. Exclusionary criteria were also evaluated via electronic medical record review and were defined as: severe mental health diagnoses (e.g., bipolar disorder, schizophrenia, major depression) and/or developmental disability (e.g., autism spectrum disorder, intellectual disability). Participants were approached during a pediatric epilepsy clinic visit or via telephone if they did not have an upcoming visit scheduled. Of the 113 families who were contacted, 73% ($N = 82$) agreed to participate. "Not interested" was the most common reason cited for participation refusal. The institutional review board granted approval, and verbal informed consent and assent were obtained from each participant and his/her legal guardian. Families were informed that youth and caregivers would receive modest compensation for their time. Emotional, personal, or logistical reasons precluded five of the 82 enrolled youth participants from completing the telephone interview. Sixty-five caregivers returned caregiver-report questionnaires via mail. Participating caregivers were mostly mothers (89%).

2.2. Instruments

2.2.1. Youth report

The Seizure Self Efficacy Scale for Children and Adolescents with Epilepsy (SSES-C; (11)) is a 15-item scale designed to measure self-efficacy in children and adolescents related to the management of their seizures. Children respond on a scale ranging from 1 ("I'm very unsure I can do that") to 5 ("I'm very sure I can do that"), and a total score is created by summing responses, with higher scores indicating higher self-efficacy. Reliability and validity estimates are strong.[11] Cronbach's alpha for our study was .85.[13]

The Children's Depression Inventory (CDI[30]) is a 27-item scale designed for use with children ages 7–17 that measures depressive symptoms over the previous two weeks. Higher score indicate increased depressive symptoms. Raw scores can be converted to T-scores, and a T-score of 66 or greater is considered clinically elevated. Further, a raw cut off score of 16 maximizes the specificity and sensitivity.[31] The CDI has demonstrated adequate reliability and validity in pediatric epilepsy populations,[32,33] and has been deemed a "well-established" assessment tool for depression in pediatric populations.[27] Cronbach's alpha for our study was 0.87.[13]

2.2.2. Caregiver report

The Epilepsy Self-Efficacy Scale (ESES[14,34]) is a 33-item scale that measures different aspects of efficacy in the self-management of epilepsy. Content and construct validity have been demonstrated to be adequate, and reliability estimates were reported as high.[14,34] With permission from the author, this measure was adapted for the present study so that questions assessed parents' report of efficacy in managing their child's seizures (e.g., "I can always manage my epilepsy in new situations" was adapted to "I can always manage my child's epilepsy in new situations." Responses ranged from zero to ten. Items were totaled, and higher scores indicated higher levels of confidence in ability to manage epilepsy. For this study, the total score was used as a continuous variable, with higher scores indicating higher self-efficacy. Cronbach's alpha was 0.92 for the current study.

The Behavior Assessment System for Children-II (BASC-II) (26) is a 160-item questionnaire designed for use by parents that measures youth emotional and behavioral functinoing. Caregivers complete the four-choice response format on either the child (ages 6–11 years) or teen (ages 12–18 years) version. As with the CDI, the BASC has also been deemed a "well-established" assessment tool for depression in pediatric populations,[27] and has demonstrated reliability and validity in pediatric epilepsy populations.[22] For the purposes of the current study, only the Depression Clinical Subscale (DEP) was used as a measure of caregiver reported depressive symptoms in youth. This subscale measures excessive feelings of unhappiness, sadness, or stress.[26] Higher scores indicate increased depressive symptoms. Raw scores can be converted to T-scores, with T-scores of 60 or greater considered clinically elevated. In the present study Cronbach's alpha was 0.91 and 0.87 for the BASC-II (DEP) (raw, 12–18 years), and BASC-II (DEP) (raw, 6–11 years), respectively.

2.2.3. Demographic and epilepsy variables

ICD-9 diagnostic codes and anti-epileptic drugs (AEDs) were obtained from electronic medical record abstraction. Seizure severity was measured based on caregiver report via a standardized questionnaire that was based on the International League Against Epilepsy seizure classification.[28,29,35] Caregivers also completed a demographic form.

2.3. Procedure

A trained interviewer conducted standardized telephone interviews with youth and transcribed answers onto response forms. Youth completed the CDI and the SSES-C during this interview. The interviewer was able to answer questions and clarify children's responses if needed. Due to the sensitive nature of some of the questions posed to YWE (i.e., CDI suicidal ideation question), a protocol for handling children's responses to these questions was utilized. In no instance was emergency intervention required. Once youth completed the telephone interviews, caregivers were mailed a packet consisting of a demographic form, seizure severity questionnaire, ESES, and BASC-2. The same safety protocol was utilized when examining caregiver responses to sensitive questions on the BASC-II (i.e., suicidal ideation). If questionnaires were not returned in the provided postage paid envelope within two weeks, the research assistant contacted caregivers via telephone to remind them and to answer any questions. After two contacts, caregivers were not phoned again.

2.4. Analyses

All analyses were conducted using SAS version 9.1 (2003 SAS Institute Inc., Cary, NC, USA). Descriptive statistics were utilized to examine the frequencies and distributions of the demographic, epilepsy-related, and psychosocial variables. Eleven caregivers and one youth had missing self-efficacy scale items (one caregiver missing four items, otherwise no more than two missing items). The missing items were imputed by replacing the item with an average of that individual's other item responses within the scale to obtain a total score. Three caregivers and one youth had missing items on the depression scales (at most two missing items). Again, missing items were imputed by replacing them with an average of that individual's other item responses within the scale to obtain a total score.

Participants who did not return either a self-efficacy and/or a depression scale (either themselves and/or their caregiver) were compared by available variables to those who completed all information by chi-square, Fisher exact, *t*-test, or Wilcoxon rank sum, as appropriate. Participants who did not return scales were removed from further analyses involving those scales. Unless otherwise specified, analyses were considered significant at $p < .05$.

2.4.1. Aim 1

The first aim of the analysis was to determine how well YWE and caregivers ratings on depressive and suicidal ideation symptoms compared, and how well their ratings on self-efficacy compared. The depression scale scores were compared by chi-square based on known cut-off values; however, the self-efficacy scales do not have cut-off values. For additional comparison the scores of each were categorized into quartiles (i.e., low, mid-low, mid-high, and high) and compared by weighted kappa coefficient with exact *p*-values.

The associations were also examined by univariate regression. The association of the depression scores was examined by linear regression after transformation of the outcome variable, CDI, through square root. Other covariates were compared to the outcome variable of this comparison, raw CDI score, by Kruskal–Wallis (for categorical) or Spearman correlation (for continuous), including time since last seizure, number of seizures in past year, caregiver rating of seizure severity, time to recover from last seizure, gender, race, age, duration of epilepsy, seizure type (partial vs. general), and number of AEDs. None showed any significant relationship ($p < 0.10$) with the CDI scores and were, thus, left out of the regression model.

The self-efficacy scores did not meet the assumptions of linear regression, even after transformations were applied. Therefore the outcome variable of this comparison, SSES-C, was dichotomized at approximately the median value, and logistic regression was utilized. Residuals were examined for outliers, and Hosmer–Lemeshow goodness of fit statistic showed adequate model fit ($p = 0.66$).

2.4.2. Aim 2

Another aim of the analysis was to examine whether there was any association between the caregiver's self-efficacy for managing their child's seizures and caregiver rating of YWE depressive symptoms. The association between the 10 covariates listed above and the outcome variable, raw BASC-II (DEP) scores were examined as described above. As before, none showed any significant relationship with the outcome variable, and were left out of the regression model. Linear regression was used to look at the association between the ESES scores and the BASC-II (DEP) scores of the caregivers. The relationship between the YWE self-efficacy and depression has been explored previously.[13]

3. Results

Seventy-seven youth completed both self-efficacy and depression forms, while 65 of the caregivers completed both self-efficacy and depression forms. Sixty-five pairs of YWE and their caregivers completed both of the self-efficacy forms, and 64 pairs completed both of the depression forms. The demographics and seizure characteristics, with variable definitions, of those participants with all four scales completed are compared to those with missing scales in Table 1. The only differences noted were those excluded were more likely to be female and to have a higher mean score on the CDI.

In terms of suicidal ideation on the BASC-II Depression scale, caregivers reported that 20/56 or 36% of YWE had thoughts of death, with six YWE having these thoughts "often" or "almost always." Caregivers also reported that 20/56 or 36% of YWE wanted to "kill themselves," with four YWE having this symptom "often." In addition, caregivers endorsed significant depressive symptoms in 27% of YWE. Eight percent of YWE ($N = 6$ of 77) scored in the clinically significant range,[13] however, 21 youth (27%) endorsed mild to moderate suicidal ideation.[36] The caseness results of the depression scale total scores of the 64 pairs of YWE and caregivers are shown in Table 2, using T-scores. Caregivers tended to score YWE higher on depressive symptoms than the youth themselves. Fisher's exact chi-square for the comparison had a *p*-value of 0.052, showing no statistically significant relationship.

When the CDI and BASC-II (DEP) T-scores were placed in quartiles and compared, weighted kappa equaled 0.27, showing some, but not strong, agreement between the youth and caregiver depression scores. Weighted kappa for the SSES-C and ESES scores in quartiles equaled 0.05, showing no agreement between the youth and caregiver self-efficacy scores.

Univariate linear regression between caregiver report of YWE depressive symptoms (BASC-II DEP) and youth report of depressive symptoms (CDI) was significant at $p = .001$, but with modest explanatory ability (adjusted $R^2 = 0.14$) (Fig. 1). The square root of the estimated total raw CDI scores were increased, on average, by

Table 1
Comparison of those included in all analyses ($n = 64$) to those excluded in some analyses ($n = 16$).

Characteristic	Included No. (%)	Excluded No. (%)	p-Value[a]
Age (years)	Mean = 14.4 (range = 10.3–17.8)	Mean = 14.7 (range = 9.5–17.9)	0.56
Sex			0.005
Female	31 (48%)	14 (87.5%)	
Male	33 (52%)	2 (12.5%)	
Race			0.77
Black	20 (31%)	4 (25%)	
White	44 (69%)	12 (75%)	
Seizure type			0.89
Generalized	16 (25%)	5 (31%)	
Partial	44 (69%)	10 (63%)	
Both	4 (6%)	1 (6%)	
Number of AEDs[b]			0.10
0–1	51 (80%)	9 (56%)	
2–3	13 (20%)	7 (44%)	
Duration of epilepsy	$n = 63$	$n = 7$	0.89
<5 years	25 (40%)	3 (43%)	
5–10 years	24 (38%)	2 (29%)	
11–15 years	14 (22%)	2 (29%)	
Most recent seizure	$n = 61$	$n = 7$	0.26
Within last month	23 (38%)	5 (71%)	
Within last year	26 (43%)	1 (14%)	
More than 1 year	12 (20%)	1 (14%)	
Seizures in past year	$n = 57$	$n = 6$	0.50
None	5 (9%)	0	
1–11	37 (65%)	3 (50%)	
12 or more	15 (26%)	3 (50%)	
Severity of seizures	$n = 54$	$n = 7$	1.0
Very mild or mild	26 (48%)	3 (43%)	
Moderate	13 (24%)	2 (29%)	
Severe or very severe	15 (28%)	2 (29%)	
Seizure recovery	$n = 59$	$n = 7$	0.44
<1 h	31 (53%)	5 (71%)	
≥1 h	28 (47%)	2 (29%)	
SSES-C total score ($n = 77$)	$n = 64$ Mean = 62.5 (range = 34–75)	$n = 13$ Mean = 57.7 (range = 35–74)	0.22
ESES total score ($n = 66$)	$n = 64$ Mean = 291 (range = 222–330)	$n = 2$[b]	n/a
Raw CDI total score ($n = 77$)	$n = 64$ Mean = 7.4 (range = 0–29)	$n = 13$ Mean = 13.5 (range = 4–30)	0.01
CDI total score (T-scores) ($n = 77$)	$n = 64$ Mean = 46.2 (range = 34–81)	$n = 13$ Mean = 56.0 (range = 41–82)	0.01
Raw BASC-II (Depression subscale) total score ($n = 65$)	$n = 64$ Mean = 10.7 (range = 0–33)	$n = 1$[c]	n/a
BASC-II (Depression subscale) total score (T-scores) ($n = 65$)	$n = 64$ Mean = 60.3 (range = 36–107)	$n = 1$[c]	n/a

[a] Chi-square, Fisher exact test, t-test, or Wilcoxon rank sum, as appropriate.
[b] Only 3 youth were taking no AEDs. In addition, 1 youth had had epilepsy surgery and a vagus nerve stimulator (VNS), and 1 had a VNS and was on the ketogenic diet.
[c] Too small for comparison.

0.06 for each 1.00 increase in the total raw BASC-II (DEP) score. The univariate logistic regression model between caregiver report of seizure self-efficacy and bivariate youth report of seizure self-efficacy showed no relationship.

Univariate linear regression between caregiver report of their own self-efficacy towards their child's seizures and their report of their child's depressive symptoms showed a significant inverse relationship ($p = .001$), but again, with modest explanatory ability

Table 2
Frequencies of CDI and BASC-II (DEP) T-scores.

Total CDI score	Total BASC-II (DEP) score			Total
	36–59	60–69 (at risk)	70–107 (clinically significant)	
34–65	33	16	13	62
66–81 (clinically elevated)	0	0	2	2
Total	33	16	15	64

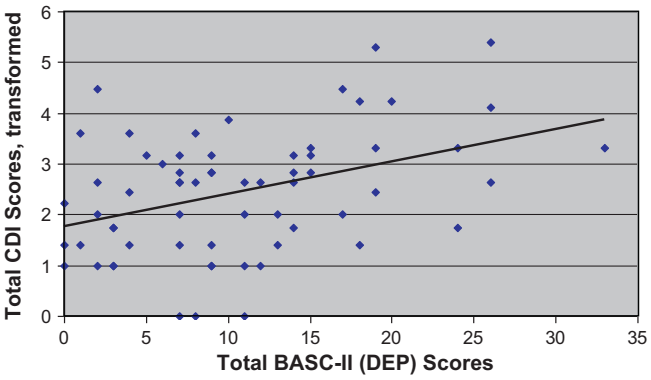

Fig. 1. Linear regression of youth report of depressive symptoms (square root of total CDI) on caregiver report of youths' depressive symptoms (total raw BASC-II (DEP)).

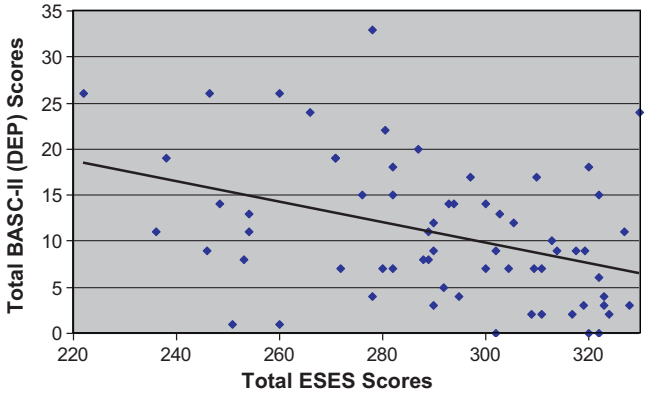

Fig. 2. Linear regression of caregiver report of youths' depressive symptoms (total raw BASC-II (DEP)) on caregiver report of their own self-efficacy toward epilepsy (total ESES).

(adjusted $R^2 = 0.14$) (Fig. 2). The total raw BASC-II (DEP) scores were decreased by one point for every 0.11 increase in total ESES score.

4. Discussion

Results supported our hypotheses that there would be low agreement between caregiver youth report of youth depressive and suicidal ideation symptoms and self-efficacy for seizure management. Specifically, the data showed that utilizing published criteria for clinical threshold cut offs for depressive symptoms in YWE on the BASC-II and CDI and comparing them by chi-square resulted in what might be considered at best only a borderline significance. Similarly, when examining caregivers' report of YWE's depressive symptoms by quartiles to youths' own report of depressive symptoms by quartiles, there was low agreement. More specifically, caregivers endorsed significant depressive symptoms in 27% of YWE, and only two of these YWE reported significant depressive symptomatology. This was mirrored by the regression results showing only 14% of the variation of the youths' report of depressive symptoms being explained by variation in their caregivers' report of YWE's depressive symptoms.

While quantitative interpretation of the results is difficult, it did show an increase in caregiver report of youth depressive symptoms was associated with an increase in youth's own report of depressive symptoms. However, when examining caregivers' report of their own self-efficacy for managing their child's seizures to the youth's report of SESM, there was neither agreement nor any relationship apparent. Results are somewhat consistent with previous findings that caregiver and youth report, particularly of internalizing behaviors, have minimal concordance.[19,20] Recent data suggests that these informant discrepancies do not suggest that one informant is necessarily more valid than another but instead that they "reflect basic realities of variations in human functioning and in how it is perceived".[37] Therefore, when assessing depressive symptoms in YWE, both caregiver and youth report are necessary to obtain a comprehensive picture of depressive symptoms.

Caregivers reported that 36% of YWE had experienced thoughts of death and suicidal ideation. These rates are somewhat higher but consistent with the rates of youth endorsed suicidal ideation in other studies of YWE[3] as well as our data (27%[36]). In other words, YWE reporting suicidal ideation are not necessarily endorsing significant depressive symptomatology, which suggests a need for routine assessment for suicidal ideation, even in youth who are not presenting with clinical depressive symptoms. It also appears that caregivers may be readily aware of suicidal ideation and able to reliably report on these symptoms for YWE. Results underscore the importance of attention to depressive symptoms and suicidal ideation in YWE, with an indication for an aggregate assessment of youth functioning via parent and youth report.

To examine a previously unexplored facet of the relationship between parent–child functioning as highlighted by ecological models of adjustment in pediatric chronic illness,[1,18] we looked at caregiver self-efficacy for management of their child's seizures in relation to caregiver report of youth depressive symptoms and youth SESM. Results supported our hypothesis by demonstrating that caregiver SESM showed an inverse relationship with their report of YWE's depressive symptoms. As caregivers reported lower confidence in their ability to manage their child's epilepsy, they also reported greater depressive symptoms in their child, providing evidence for "transactional" stress[38,39] between the youth and parent. This same SESM-depressive symptom relationship was found for YWE report in our previous investigation,[13] and both studies support the importance of assessing SESM with respect to depressive symptoms in YWE. However, caregiver and youth SESM was not related, indicating that self-efficacy is a complicated factor of self-management and requires more in-depth investigation in families of YWE.

Indeed, SESM is related to actual self-management outcome behaviors in adults,[10,14–16] and may likely be a salient target of intervention for YWE. We have developed "Coping Openly with Epilepsy" (COPE), a group pediatric epilepsy self-management intervention for YWE ages 10–15 and their caregivers. COPE was designed to specifically target self-efficacy and coping skill enhancement in the context of epilepsy management.[40] Pilot findings indicate improved coping in the areas of social support and SESM for YWE following the COPE intervention.[41] COPE delineates primary (changing behavior when a situation is under one's control) from secondary (changing thinking patterns when a situation is not under one's control) coping,[42] which seems particularly pertinent for YWE who may experience a loss of control with seizures and uncertainty for when the next seizure will occur[43] but can "take control" of their epilepsy by changing daily behavior to better manage their epilepsy.

Limitations of the current study include inability to include 20% of the participants enrolled in all analyses due to missing self-efficacy or depression scale data from caregivers. While those excluded were very similar to those included in the analysis, unfortunately the excluded youth participants had significantly higher mean score on the CDI. Increased power would be preferable to strengthen results. In addition, weighted kappa was used with two different scales rather than two scales with identical ratings, so interpretation carries some risk; however, the results agree in general with the regression. Another limitation was the exclusion of data on caregiver distress, which is prudent given that caregiver distress has been shown to effect caregiver ratings of youth psychosocial functioning.[20] However, the purpose

of our study was to compare caregiver and youth ratings, not to discern which is "more valid." Enrollment rates would have likely been higher with in-person recruitment; however, telephone interviews increased convenience for study participation. It is also possible that the trained interviewer may have incorrectly heard or recorded a response or that youth refrained from endorsing depressive symptoms in the presence of the interviewer; however, a standardized protocol was utilized to reduce error.

5. Conclusions

Despite the limitations of the current study, results highlight three important areas for clinical consideration: (1) assessment of depressive symptoms, suicidal ideation, and self-efficacy for seizure management using *both* YWE and caregiver report, (2) the transactional relationship between parental self-efficacy for seizure management and youth depressive symptoms, and (3) continued research to identify targets for and effectiveness of self- and family-management interventions for youth with epilepsy and caregivers.

Conflict of interest

None of the authors has any conflict of interest to disclose.

We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

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References

1. Austin JK, Caplan R. Behavioral and psychiatric comorbidities in pediatric epilepsy: toward an integrative model. *Epilepsia* 2007;**48**:1639–51.
2. Kanner AM. Depression and epilepsy: a bidirectional relation? *Epilepsia* 2011;**52**:21–7.
3. Caplan R, Siddarth P, Gurbani S, Hanson R, Sankar R, Shields WD. Depression and anxiety disorders in pediatric epilepsy. *Epilepsia* 2005;**46**:720–30.
4. Ettinger AB, Weisbrot DM, Nolan EE, Gadow KD, Vitale SA, Andriola MR, et al. Symptoms of depression and anxiety in pediatric epilepsy patients. *Epilepsia* 1998;**39**:595–9.
5. Jones J, Watson R, Sheth R, Caplan R, Koehn M, Seidenberg M, et al. Psychiatric comorbidity in children with new onset epilepsy. *Dev Med Child Neurol* 2007;**49**:493–7.
6. Shinnar S, Pellock JM. Update on the epidemiology and prognosis of pediatric epilepsy. *J Child Neurol* 2002;**17**:S4–17.
7. Schilling LS, Grey M, Knafl KA. The concept of self-management of type 1 diabetes in children and adolescents: an evolutionary concept analysis. *J Adv Nurs* 2002;**37**:87–99.
8. Grey M, Knafl K, McCorkle R. A framework for the study of self- and family management of chronic conditions. *Nurs Outlook* 2006;**54**:278–86.
9. Rodenburg R, Meijer AM, Dekovic M, Aldenkamp AP. Family factors and psychopathology in children with epilepsy: a literature review. *Epilepsy Behav* 2005;**6**:488–503.
10. Dilorio C, Faherty B, Manteuffel B. Self-efficacy and social support in self-management of epilepsy. *West J Nurs Res* 1992;**14**:292–307.
11. Caplin D, Austin JK, Dunn DW, Shen J, Perkins S. Development of a self-efficacy scale for children and adolescents with epilepsy. *Children's Health Care* 2002;**31**:295–309.
12. Austin JK, Dunn DW, Perkins SM, Shen J. Youth with epilepsy: development of a model of children's attitudes toward their condition. *Children's Health Care* 2006;**35**:123–40.
13. Wagner JL, Smith G, Ferguson P, Horton S, Wilson E. A learned hopelessness model of depressive symptoms in youth with epilepsy. *J Pediatr Psychol* 2009;**34**:89–96.
14. Dilorio C, Faherty B, Manteuffel B. Epilepsy self-management: partial replication and extension. *Res Nurs Health* 1994;**17**:167–74.
15. Robinson E, Dilorio C, DePadilla L, McCarty F, Yeager K, Henry T, et al. Psychosocial predictors of lifestyle management in adults with epilepsy. *Epilepsy Behav* 2008;**13**:523–8.
16. Dilorio C, Faherty B, Manteuffel B. The development and testing of an instrument to measure self-efficacy in individuals with epilepsy. *J Neurosci Nurs* 1992;**24**:9–13.
17. Lorig K, Holman HR. Self-management education: history, definition, outcomes, and mechanisms. *Ann Behav Med* 2003;**26**:1–7.
18. Spirito A, Kazak A. *Multiperson and systemic interventions. Effective and emerging treatment in pediatric psychology.* New York: Oxford University Press; 2006 pp. 36–60.
19. Silverman WK, Ollendick TH. Evidence-based assessment of anxiety and its disorders in children and adolescents. *J Clin Child Adolesc Psychol* 2005;**34**:380–411.
20. Huberty T, Austin J, Harezlak J, Dunn D, Ambrosius W. Informant agreement in behavior ratings for children with epilepsy. *Epilepsy Behav* 2000;**1**:427–35.
21. Caplan R, Sagun J, Siddarth P, Gurbani S, Koh S, Gowrinathan R, et al. Social competence in pediatric epilepsy: insights into underlying mechanisms. *Epilepsy Behav* 2005;**6**:218–28.
22. Bender H, Auciello D, Morrison C, MacAllister W, Zaroff C. Comparing the convergent validity and clinical utility of the Behavior Assessment System for Children-Parent Rating Scales and Child Behavior Checklist in children with epilepsy. *Epilepsy Behav* 2008;**13**:237–42.
23. Achenbach T, Rescorla L. *Manual for the ASEBA school-age forms and profiles.* Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families; 2001.
24. Austin JK, Dunn DW, Caffrey HM, Perkins SM, Harezlak J, Rose DF. Recurrent seizures and behavior problems in children with first recognized seizures: a prospective study. *Epilepsia* 2002;**43**:1564–73.
25. Austin JK, Dunn DW, Huster GA. Childhood epilepsy and asthma: changes in behavior problems related to gender and change in condition severity. *Epilepsia* 2000;**41**:615–23.
26. Reynolds C, Kamphaus R. *Behavior assessment system for children.* 2nd ed. Circle Pines, MN: AGS Publishing; 2004.
27. Holmbeck GN, Welborn TA, Bachanas P, Garber J, Miller KB, Abad M. Evidence-based assessment in pediatric psychology: measures of psychosocial adjustment and psychopathology. *J Pediatr Psychol* 2008;**33**:958–80.
28. Wagner JL, Smith G, Ferguson PL, Horton S, Wilson E. A hopelessness model of depressive symptoms in youth with epilepsy. *J Pediatr Psychol* 2009;**34**:89–96.
29. Wagner JL, Smith GM, Ferguson PL, Wannamaker BB. Caregiver perceptions of seizure severity in pediatric epilepsy. *Epilepsia* 2009;**50**:2102–9.
30. Kovacs M. The children's depression inventory (CDI). *Psychopharmacol Bull* 1985;**21**:995–8.
31. Timbremont B, Braet C, Dreessen L. Assessing depression in youth: relation between the children's depression inventory and a structured interview. *J Clin Child Adolesc Psychol* 2004;**33**:149–57.
32. Austin JK, MacLeod J, Dunn DW, Shen J, Perkins SM. Measuring stigma in children with epilepsy and their parents: instrument development and testing. *Epilepsy Behav* 2004;**5**:472–82.
33. Austin JK, Perkins SM, Johnson CS, Fastenau PS, Byars AW, deGrauw TJ, et al. Self-esteem and symptoms of depression in children with seizures: relationships with neuropsychological functioning and family variables over time. *Epilepsia* 2010;**51**:2074–83.
34. Dilorio C, Osborne Shafer P, Letz R, Henry T, Schomer DL, Yeager K. The association of stigma with self-management and perceptions of health care among adults with epilepsy. *Epilepsy Behav* 2003;**4**:259–67.
35. Ozuna J, Sierzant T, Bell T, Buelow JM, Callana M, Lannon S. *American association of neurosciences nurses clinical guideline series: seizure assessment.* Chicago: American Association of Neurosciences Nurses; 1997.
36. Wagner J, Ferguson P, Smith G. Coping measures in pediatric epilepsy. *Epilepsy Behav*, doi:10.1016/j.yebeh.2012.02.017, in press.
37. Achenbach T. Commentary: definitely more than measurement error: But how should we understand and deal with informant discrepancies? *J Clin Child Adolesc Psychol* 2011;**40**:80–6.
38. Wagner J, Chaney J, Hommel K, Page M, Mullins L, White M, et al. The influence of parental distress on child depressive symptomatology in juvenile rheumatic disease: the moderating effect of illness intrusiveness. *J Pediatr Psychol* 2003;**28**:453–62.
39. White M, Chaney J, Mullins L, Wagner J, Hommel K, Andrews N, et al. Children's perceived illness uncertainty as a moderator in the parent–child distress relationship in juvenile rheumatic diseases. *Rehabil Psychol* 2005;**50**:224–31.
40. Wagner JL, Smith G, Ferguson PL, van Bakergem K, Hrisko S. Feasibility, accuracy, and satisfaction of an integrated cognitive-behavioral and self-management intervention for youth with epilepsy and caregivers: Coping Openly and Personally with Epilepsy (COPE). *Seizure Eur J Epilepsy* 2011;**20**:462–7.
41. Wagner JL, Smith G, Ferguson P, van Bakergem K, Hrisko S. Pilot study of an integrated cognitive-behavioral and self-management intervention for youth with epilepsy and caregivers: Coping Openly and Personally with Epilepsy (COPE). *Epilepsy Behav* 2010;**18**:280–5.
42. Weisz J, Southam-Gerow MA, Gordis EB, Connor-Smith J. Primary and secondary control enhancement training for youth depression: applying the deployment-focused model of treatment. In: Kazdin AE, Weisz JR, editors. *Evidence-based psychotherapies for children and adolescents.* New York: Guilford Press; 2003. p. 165–83.
43. McNelis A, Musick B, Austin J, Dunn D, Creasy K. Psychosocial care needs of children with new-onset seizures. *J Neurosci Nurs* 1998;**30**:161–5.